December 15, 2017

VIA ELECTRONIC FILING

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: Notice of Ex Parte Presentation
PS Docket No. 17-344

Dear Ms. Dortch:

On December 13, 2017, Brian King, Senior Vice President – National Technology Service Delivery and Operations, T-Mobile USA, Inc.[1] ("T-Mobile") along with the undersigned representatives of T-Mobile met with FCC representatives in three separate meetings to discuss the company's response efforts during the 2017 hurricane season. We first met with Umair Javed of Commissioner Rosenworcel's office. We then met with Michael Carowitz and Ryan McDonald of Chairman Pai's office as well as Dana Shaffer and Charles Mathias of the Wireless Telecommunications Bureau. In addition, the T-Mobile representatives met with Debra Jordan, Lauren Kravetz, Renee Roland (by phone), and Chris Anderson of the Public Safety Homeland Security Bureau and Ronald Repasi of the Office of Engineering and Technology.

The T-Mobile representatives described to the group the weather-related impacts to its network operations during Hurricanes Harvey, Irma and Maria and T-Mobile's response, recovery and restoration activities. The group further discussed T-Mobile's observations with respect to what worked well, as well as changes that would improve coordination among the multiple interests that must work together to respond, including backhaul providers and power companies. T-Mobile also discussed proposed changes to DIRS reporting that would provide a more accurate picture of the service available in a disaster area. The substance of these conversations is further detailed in the attached powerpoint.

[1] T-Mobile USA, Inc. is a wholly-owned subsidiary of T-Mobile US, Inc., a publicly traded company.

Marlene H. Dortch
Secretary
December 15, 2017

This letter is submitted in accordance with Section 1.1206(b) of the Commission's rules, 47 C.F.R. § 1.1206(b). Please contact the undersigned if there are questions concerning this filing.

Respectfully submitted,

/s/ Steve Sharkey
Steve Sharkey
Vice President, Technology and Engineering Policy

/s/ John Hunter
John Hunter
Sr. Director, Technology and Engineering Policy

/s/ Shellie Blakeney
Shellie Blakeney
Director, Federal Regulatory Affairs

cc: Michael Carowitz
Umair Javed
Dana Shaffer
Charles Mathias
Debra Jordan
Lauren Kravetz
Renee Roland
Chris Anderson
Ronald Repasi
Ryan McDonald

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Hurricane Briefing

13 December 2017

HURRICANE RESPONSE 2017

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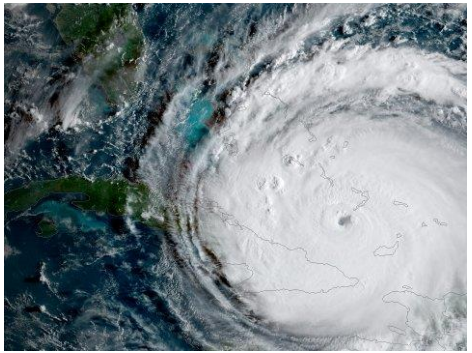
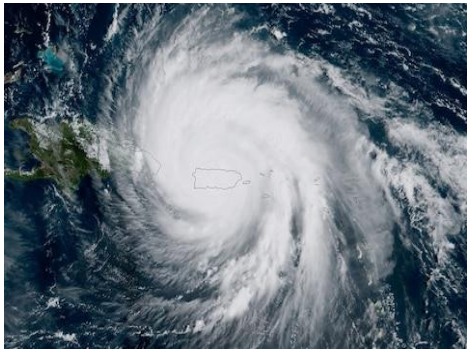
Hurricane Harvey



Hurricane Irma



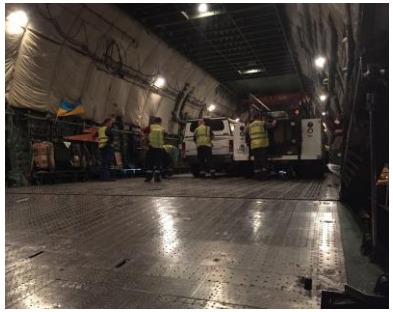
Maria & Puerto Rico

Overview – 3 Category 4/5 Hurricanes < 30 days

- ❑ Hurricanes: Harvey, Irma & Maria.
- ❑ Extensive network impact across 5 States, PR & USVI
- ❑ Rapid response & recovery
  - ”Normal” in 2-5 days (Excl. PR & USVI)
  - Over 500 T-Mobile personnel involved in recovery
  - Over 500 employees from other companies
  - Over 2000 Generators ran, deployed & refueled

- ❑ Unprecedented logistical exercise Including PR ”Airlift”
  - Many aircraft filled with critical supplies & equipment
  - Deployed Emergency Volunteer Teams (EVT) from other markets
  - Multiple barges loaded with equipment & vehicles
  - Even a floating hotel to supplement accommodation

- ❑ Currently: Commercial Power & Backhaul still sparse in PR
  - Most sites still on generator power (70%)
  - Continued extensive Fiber damage & cuts
  - Close to all Sites Recovered & Repaired



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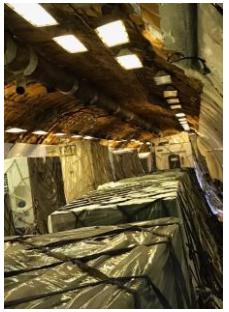
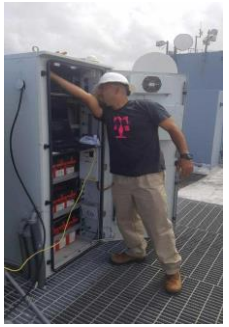


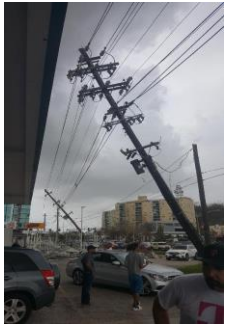
Supplies & Aid

Floating Hotel

Site Without Power



EVT Technician



Power Distro.

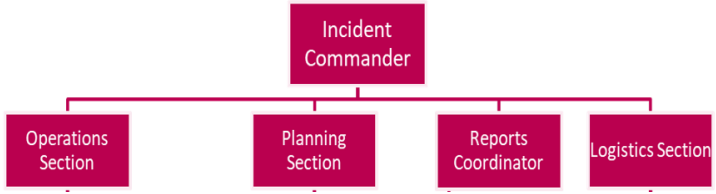
Practice & Preparation is Key

- Emergency Operation Center (EOC) regular drills using ICS structure
  - Clear Command & Control at National and Local Levels
  - Vendor contracts in place, with contingencies
  - Emergency Volunteer Teams skills pre-vetted
  - State & Federal regulatory authorization

- Areas pre-allocated for staging of personnel & equipment
  - Fuel Trucks
  - COWS/COLTS
  - Supplemental generators
  - Other equipment & supplies, such as Microwave equipment

- Prepared for the unexpected
  - Plan for contingencies and react fast
  - Have strong logistical support (Advance contracts)
  - Good tooling & coordination
  - Empowered ICS section leadership

- Carrier mutual coordination.
  - Discussions around Backhaul & Roaming support



ICS Structure


Pre- Staged Fuel & Generators


Logistics Offload


Temporary EOC For Houston

Hurricane Harvey Impacting South Texas, Houston & Louisiana

- More than 85% of Network remained operational.
- Massive coastal destruction at landfall in Rockport , TX
  - Several sites damaged by wind
  - COWS Deployed. Other areas restored within a few days
- Historic flooding in SE Texas and Houston.
  - Controlled flooding & levy relief created additional outages
  - Many areas only accessible via Airboat
  - Utilized helicopter reconnaissance
- Why did we fair so well in Harvey & Houston?
  - Coverage is dense for capacity reasons
    - We are able to optimize around “Holes”
  - Known flood or storm surge areas are built on platforms
  - Limited loss of Backhaul & Power connectivity
  - Houston has a modern Power & Fiber infrastructure

Aransas Pass Before

Aransas Pass After

Extensive Flooding

Airboat Deployment

Flood Prone Sites on Elevated Platforms

Hurricane Irma Impacting USVI, Puerto Rico, Florida & Georgia

- Network suffered wide impact due to Irma
  - One-Two punch with USVI and Puerto Rico, followed by mainland landfall in Florida Keys

- Severe Power outages and loss of fiber connectivity
  - Supplemental generators deployed
  - Power restored relatively quickly

- Full recovery in South Florida took over 10 days
  - Substantial coverage layer restored in 5 days
  - Deployed COWs as well as Microwave & Satellite Backhaul solutions
  - Landlord access in South Florida hampered some recovery

- South Florida (Miami) has an extremely dense network
  - Restoration of outdoor blanket coverage was a priority
  - Opened up roaming in hard hit Naples area. (Few Days Only)

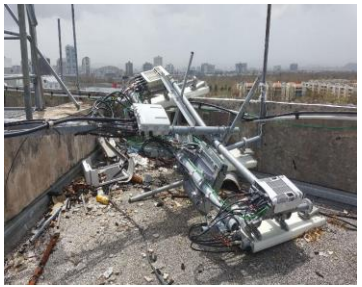
- Note: DIRS reporting reflects % of total sites recovered
  - This worked well, but is not truly reflective of coverage restored.

Drone Footage In FL Keys

Hurricane Maria Impacting Puerto Rico & Continued in USVI

- Island infrastructure devastated by CAT 5 winds & flooding
  - Power grid & fiber Backhaul decimated
  - ~2 % of towers completely destroyed
  - Many antennas blown off sites or disoriented
  - All 520+ sites needing some form of visit & repair
- Mobile switch site lost mainland connectivity For ~ 3 Days
  - 4 Redundant & diverse high-capacity circuits lost
    - Multiple fiber cuts and landing station flooding
- T-Mobile initiated & coordinated Multi-carrier mutual response calls
  - Brokered inter- company roaming & restoration focus
  - Avoided duplication of initial restoration efforts
  - Coordinated government focus in local Puerto Rico EOC
- Many logistical challenges in spite of advance preparation
  - San Juan airport & sea ports damaged
  - Cargo aircraft sent the minute the airport re-opened
    - Gave space on AN 124 to AT&T for their generators

San Juan Flooding



Example Antenna Damage

Supply Barge

AN 124 Cargo Aircraft In Miami

Maria's impact on Puerto Rico was Unprecedented

- Prior to Maria, T-Mobile's Puerto Rico Network was >95% fiber fed
  - Engineered to provide optimal LTE performance
  - More resilient (In Normal Circumstances) than copper or Microwave
- Primary aerial fiber plant was destroyed along with poles feeding the Power grid.
- Today: Fiber restoration has been slow.
  - We have utilized an additional fiber provider beyond our primary LEC
  - We have built from scratch an extensive Microwave network
    - Providing critical Backhaul using restored fiber as a hub
- Power restoration continues to frustrate
  - Continued blackouts in some previously restored areas.
  - ~70% of T-Mobile sites are still running on temporary generators
  - Very little sign of restoration in remote areas
  - Will likely take months, if not a year to fully recover
  - Fixed & portable generators meant for "Temporary" power
    - Have been the only source and are in need of repair and replacement

Power and Fiber Damage

T-Mobile's Response to Maria Was Rapid and Decisive

- Prior to Maria, T-Mobile pre-shipped critical supplies to Puerto Rico
- Before Airport was reopened, T-Mobile had 3 Large Transport Planes Loaded & Ready
  - Flew in Large AN 124 cargo plane from Europe
  - T-Mobile even shipped generator supplies of behalf of DHS
- T-Mobile worked with FAA to loan a large Generator to PR Airport to ensure it reopened
  - Some of the first planes that flew were T-Mobile Cargo and personnel flights
- T-Mobile hosted Multi-carrier conference calls and quickly deployed our EVT volunteers
- Our response didn't just stop at network restoration
  - Shipped in food & water and other personal supplies
  - Didn't stop until all Puerto Rico employees were accounted for
  - Used offices as temporary shelter and safe care center for employees families
  - Every local employee (600+) was provided with a personal generator & drinking Water
  - We partnered with Local entities to supply hard hit communities with critical supplies
- Our Commitment in Puerto Rico is to help communities rebuild

T-Mobile Community Response

Alternate Approaches to Connect Customers

- FCC Should be commended for prompt approval of STAs and waivers
- No stone left unturned to restore coverage or power
  - Initial deployment of Satellite Backhaul transport
    - Able to light up Macro site coverage as opposed to COWS
  - Quickly added a second supplier (RigNet)
    - LTE Small cells with limited radius coverage
    - Rapid deployment
- Reduced generator & fuel theft via security & sharing
  - Also GPS Tracking Devices
- Worked with Google to establish Project Loon 4G data coverage
  - Extensive lab work with Google
  - Established roaming paradigm & customer notifications
- Also worked with Vanu Bose and Vanu coverage solutions
  - 2G small cell service via satellite backhaul in hard to reach areas across the island
  - Utilized T-Mobile 2G frequencies (Lease)

RigNet

Satellite Macro Sites

Project Loon

Vanu Deploying in PR

Key Points.

- Industry Network resiliency framework worked well
  - Hurricane Nate – Very limited network impact
  - Recent windstorms also showed improved resiliency
  - Many previous hardening efforts have been focused on power
  - Must now take into consideration how backhaul is fed to a site (Aerial vs Buried)
    - Consider backup connectivity to critical coverage sites

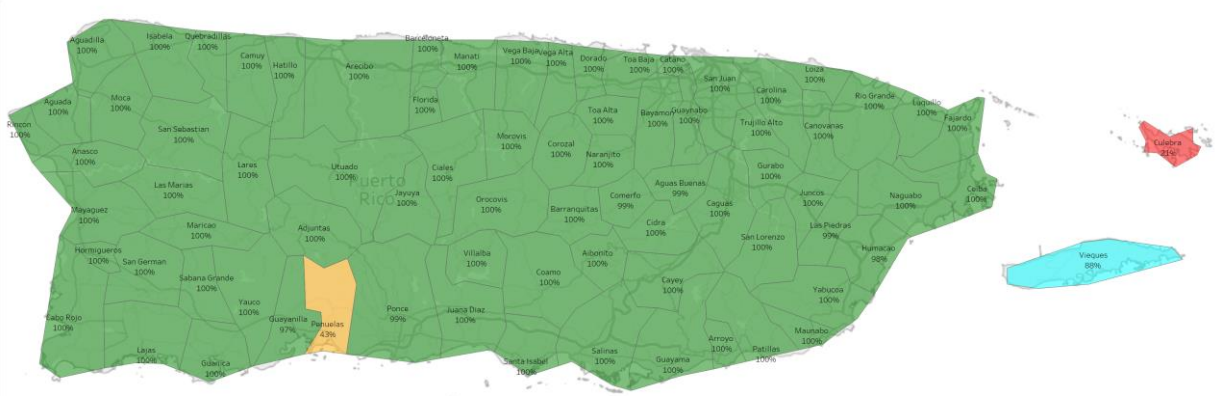
- Unprecedented mutual aid & close collaboration with other wireless carriers & suppliers
  - Needs strong executive sponsorship
  - T-Mobile proud to be at the forefront in leading industry collaboration efforts
    - We took and drove a non-competitive view
  - Extraordinary level of communication around site restoration & priorities
  - All carriers leveraged roaming and optimized through congestion

- DIRS Reporting ongoing for duration of restoration
  - ***Due to the unique nature of Maria as well as the logistical challenges impacting recovery efforts, DIRS only provides a limited view of how well the recovery effort is progressing***
  - At the request of DHS and the FCC, T-Mobile is voluntarily submitting additional propagation site data on a limited basis to assist in compiling an aggregate view

Alternative Reporting Approach

- Population Covered is the most accurate method to assess recovery efforts in following a large hurricane
  - Baselined against pre-storm covered pops
  - Typical outdoor coverage for LTE is depicted at -118 dBm
    - This has been verified on numerous occasions as good outdoor coverage for both voice & data
  - Other capacity or densification sites, can be optimized around, until restored

- The amount of registered customers is also a good barometer to assess pops covered
  - Currently, in PR, we are at 100% of registered users on the network, as compared to the pre-storm event
  - ***In the case of Maria, we also saw ~100K Customers have left the Island***



Example: Alternative Covered Pops View, Based on Current DIRS Municipality (County) Reporting

Outdoor Recovered %
0.0 100.0

Similar to DIRS Model

Example Only
Rio Grande Municipality
Baseline Covered Pops = 51,791
Restored Covered Pops = 50,473
97.5% Coverage Restored.

Conclusion – 2017 Hurricane Season Was Exceptional

- In addition to hurricanes Harvey, Irma and Maria, T-Mobile has faced additional Challenges from Mother Nature
  - Hurricane Nate, California Wildfires, New England and Pacific Northwest Windstorms

- Events overlapped or were simultaneous
  - Emphasizes need to maintain a flexible, prepared workforce and strong logistical support

- In spite of events & challenges, wireless networks are generally resilient
  - This “hardening” will continue through effective competition and improved best practices
    - T-Mobile is committed to providing our customers and first responders a resilient network
  - Power and Backhaul continue to be areas of weakness
    - Need improved cooperation and coordination from Power and fixed network Backhaul providers
    - Consider including backhaul providers in resiliency framework

- T-Mobile would be a proponent of changing DIRS reporting to show % of covered pops restored
  - We firmly believe that this is more representative of actual coverage restored and more useful to public

- Streamline government reporting to limit multiple requests for information (as well as the types such requests)

- Ensure effective escalation process amongst parties of the resiliency framework as necessary